
काली, चित्रकला, जलरोधी, स्याही —
विशिष्टि
(दूसरा पुनरीक्षण)

Ink, Drawing, Waterproof, Black —
Specification
(Second Revision)

ICS 87.080

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FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Printing Inks, Stationery and Allied Product Sectional Committee had been approved by the Chemical Division Council.

This standard was first published in 1955 and subsequently revised in 1971 incorporating requirements with methods of test for accelerated ageing, clogging and permanence of ink.

This standard is being revised with the aim of updating the standard and, also to take into consideration the technical advancements that would have been taken place since the publication of this standard. Also, Amendment No. 1 1986 has been incorporated.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

INK, DRAWING, WATERPROOF, BLACK — SPECIFICATION

(Second Revision)

1 SCOPE

This standard specifies the requirements and methods of sampling and tests of black waterproof ink for drawing.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMINOLOGIES

3.1 For the purpose of this standard, the definitions given in IS 4395, in addition to the following, shall apply.

3.1.1 *Drawing Paper*

Strong and close textured paper of varied qualities and surfaces used for drawing, capable of withstanding steel eraser (*see* IS 3064).

3.1.2 *Tracing Cloth*

A very fine plain-weave cotton fabric treated in a special manner to make it suitable for use as tracing drawings (*see* IS 2037).

3.1.3 *Tracing Paper*

Paper sufficiently transparent to allow a design to be traced through and reproduced.

4 COMPOSITION

The material shall be composed of carbon, in a state of stable suspension in a liquid medium. It may contain a dye in the form of a toner. It shall also contain suitable preservative and water-proofing agent.

5 REQUIREMENTS

5.1 General

The composition of the material shall be such, that the product does not have any adverse effect on the tuft of the artist brush.

5.2 Working Quality

The material on continual use shall not dry in the pen and there shall be no smudging. It shall adhere to drawing paper or cellulose acetate transparent medium for tracing drawing. Tracing paper and, tracing cloth shall not penetrate to the other side.

5.3 Sediment

The material shall not show any appreciable settling of the pigment either at the bottom or on the sides, when preserved undisturbed in a closed container for a week.

5.4 Waterproof Quality and Solvent Resistance

The material shall comply with the requirements of the test prescribed, in Annex B.

5.5 Opacity

The material shall be opaque and shall comply with the requirements of the test, prescribed in Annex C.

5.6 Performance

The material shall comply with the test prescribed, in Annex D.

5.7 Permanence

The material shall conform to the requirements of the test prescribed, in Annex E.

5.8 Growth of Mould, Thickening and Separation of Pigments

The material shall not show any growth of mould, thickening or separation of pigments, when tested according to the method prescribed, in Annex F.

5.9 Clogging

The material shall not clog the pen and shall pass the test prescribed in Annex G.

5.10 Keeping Quality

The material shall pass the accelerated ageing test described in 5.11 and shall be in usable condition for at least, one year from the date of packing.

5.11 Accelerated Ageing Test

Keep the ink in sealed bottles, in an air-oven at a temperature of 55°C for a period of one month.

At the end of this period, it shall not show any sign of deterioration with respect to the requirements prescribed at 5.1 to 5.9.

6 PACKING AND MARKING

6.1 Packing

The material shall be packed in glass containers of 15 ml or 30 ml capacity or any other packing as agreed to between the purchaser and the supplier. It shall be furnished with a quill pen securely fixed to the cork, sealing the phial, so as to reach the bottom of the phial. The cork shall be of plastic top which may be easily manipulated.

6.2 Marking

6.2.1 Each container shall be marked clearly and indelibly in a location where it is accessible and visible with the following information:

- a) Name of the material, and its colour (black);
- b) volume, in ml;
- c) Manufacturer's name and trade-mark, if any;
- d) Lot number in code or otherwise to enable the date of manufacture to be traced from records; and
- e) Month and year of the manufacturer.

6.2.2 BIS Certification Marking

The containers may also be marked with the Standard Mark.

6.2.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations made thereunder. Details of the conditions under which the licence for use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7 SAMPLING

The method of drawing representative samples of the material from a lot, the number of tests to be performed and the criteria of finding the conformity of the material to the requirements of this standard shall be as prescribed in Annex H.

ANNEX A*(Clause 2)***LIST OF REFERRED INDIAN STANDARDS**

<i>IS No.</i>	<i>Title</i>
IS 2037 : 1986	Specification for tracing cloth
IS 3064 : 1986	Handmade drawing paper
IS 4395 : 1987	Glossary of terms related to ink and allied industries (<i>first revision</i>)
IS 4905 : 2015/ ISO 24153 : 2009	Random sampling and randomization procedures (<i>first revision</i>)

ANNEX B*(Clause 5.4)***TEST FOR WATERPROOF QUALITY AND SOLVENT RESISTANCE****B-1 PROCEDURE****B-1.1** The test shall be carried out with a clean line pen.**B-1.2** Draw a few lines (0.5 mm thick, 5 mm apart and 150 mm long) or figures or both on the matt side of:

- cellulose acetate transparent medium for tracing drawings;
- drawing paper;
- tracing cloth; and
- tracing paper.

B-1.3 Mark off the drawing into two equal parts, and allow to dry for 12 h and then, subject to the following tests. Make the tests on sections selected from each one of the two equal parts.**B-1.3.1** Place four drops of water and spread them over the drawing for a length of about 25 mm applying no rubbing or friction. Allow the drawing to dry normally. There shall be no spreading of ink or reduction of colour.**B-1.3.2** Soak the drawing for a length of about 25 mm with water by a sponge and then blot them with a clean piece of blotting paper. There shall be no stain on the blotting paper.**B-1.3.3** Place four drops of petrol or benzene and spread them over the drawing which has been allowed to dry for a further period of 12 h, to a length of about 25 mm applying no rubbing or friction. Repeat the operation if necessary, to keep the surface wet for at least 5 min. There shall be no spreading of ink or reduction of colour.**ANNEX C***(Clause 5.5)***TEST FOR OPACITY****C-1 PROCEDURE****C-1.1** Using a clean line pen, draw a few lines or figures or both on the dull side of a tracing cloth and wait, till these dry up completely. Hold the tracing cloth against

a strong lighted background and examine whether these lines or figures or both are opaque.

ANNEX D

(Clause 5.6)

TEST FOR PERFORMANCE

D-1 PROCEDURE

D-1.1 The test shall be carried out with a clean line pen.

D-1.2 Set the pen (preferably with an opening of approximately 0.08 mm) and, fill it with sufficient ink to draw a few lines or figures or both (preferably more than 5 lines, each about 150 mm long and approximately, about 5 mm apart) on the matt side of:

- a) drawing paper;
- b) tracing cloth,;
- c) tracing paper; and
- d) cellulose acetate transparent medium for tracing drawings.

D-1.3 The ink shall be considered as unserviceable, if it is not possible to draw sharp and well defined edges, without special effort to promote the flow of the ink.

D-1.3.1 Four minutes after the lines or figures have been drawn, rub them with finger tips, previously washed with ethyl ether. There shall be no blurring or smudging. They shall also be free from a tendency to flake off.

D-1.4 Set the pen with an opening of approximately 0.5 mm and draws 10 parallel lines (preferably 50 mm long and 5 mm apart) on the matt side of cellulose acetate transparent medium for tracing drawings,

drawing paper, etc. After allowing these lines to dry for a reasonable time (say, for 10 min) draw a few lines or figures or both of the same width and length or dimensions, at right angles to the parallel lines already drawn. (The pen should always be filled with, as nearly as possible, the same volume of ink, and there shall be no change in the setting of the pen at any time, during the progress of this test. The ruler used shall have a square edge, that is, it shall not be bevelled). The material shall be considered to have passed the test if it conforms to the requirements laid down in **D-1.4.1** to **D-1.4.3** below.

D-1.4.1 The ends of the lines shall show no noticeable non-uniformity in width.

D-1.4.2 There shall be no marked variation in the thickness of the lines of any one surface.

D-1.4.3 The intersecting lines shall be free from distortion or blots caused by the ink, and/or any spreading under the ruling edge.

D-1.5 Erase with an eraser a reasonable length of line, say 25 mm in length, drawn on the matt side of the tracing cloth and tracing paper.

D-1.6 The ink shall be regarded as not acceptable, if it is not possible to secure complete erasure without leaving any stain.

ANNEX E

(Clause 5.7)

TEST FOR PERMANENCE

E-1 PROCEDURE

E-1.1 Cut into two portions the paper and the cloth which are subjected for test as described at **D-1.2**. Expose one strip each of the drawing paper, tracing cloth, tracing paper and cellulose acetate transparent medium to an ultraviolet lamp for a total period of 48 h at room temperature. The strips shall be placed at a

distance of 250 mm normal to the rays. The lamp shall be of 125 watts, 125 volts, 1.15 A current and emits UV of wave length 365 nm.

E-1.2 The ink shall satisfy the requirements of the test if there is no evidence of fading when compared with the original unexposed strips.

ANNEX F

(Clause 5.8)

TEST FOR GROWTH OF MOULD, THICKENING AND SEPARATION OF PIGMENTS

F-1 PROCEDURE

F-1.1 Transfer 5 ml of the material into a 50 ml of beaker and, inoculate with spores of:

- a) *Aspergillus niger*;
- b) *Pullularia pullulans*; and
- c) *Penicillium pinophilum*.

F-1.2 Keep it in a moist chamber for two weeks at $37 \pm 1^\circ\text{C}$. After the expiry of this period, the ink shall not show any growth of mould, thickening or separation of pigments.

ANNEX G

(Clause 5.9)

TEST FOR FREEDOM FROM CLOGGING

G-1 PROCEDURE

G-1.1 Set the line pen with an opening of approximately 0.5 mm and fill it with sufficient ink. Draw 5 parallel lines of 50 mm long each and about 5 mm apart on tracing paper. As soon as the drawing of the fifth line

is completed, start the stop watch and count 30 s. At the end of 30 s, once again draw 5 parallel lines continuously each of 50 mm long and 5 mm apart.

G-1.2 The ink shall be considered to have conformed to the requirements of the test if it is possible to draw 5 clear lines after the interval of 30 s.

ANNEX H

(Clause 7.1)

SAMPLING OF INK, DRAWING, WATERPROOF, BLACK

H-1 GENERAL REQUIREMENTS OF SAMPLING

H-1.1 In drawing, preparing, storing and handling of test samples, the following precautions and directions shall be observed.

H-1.2 Samples shall not be taken in an exposed place.

H-1.3 The sampling instrument shall be clean and dry when used.

H-1.4 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples, from adventitious contamination.

H-1.5 To draw a representative sample, the contents of each bottle selected for sampling shall be thoroughly mixed.

H-1.6 The samples shall be filled in clean, dry, air-tight glass containers on which the material has no action.

H-1.7 The sample containers shall be of such a size that they are almost completely filled by the sample.

H-1.8 Each sample container shall be sealed air-tight with a stopper after filling, and marked with full particulars of the material as given in 6.2 and the date of sampling.

H-1.9 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

H-2 SCALE OF SAMPLING

H-2.1 Lot

All the bottles of the same size, in a single consignment from the same batch of manufacture shall constitute a lot.

H-2.1.1 Samples shall be tested from each lot for ascertaining the conformity of the material to the requirements of the specification.

H-2.2 The number (n) of bottles to be chosen from a lot, shall depend on the size of the lot, and shall be in accordance with Table 1.

Table 1 Scale of Sampling
(Clause H-2.2)

Sl No.	Lot Size	No. of Bottles to be Selected
(1)	(2)	(3)
i)	(N)	(n)
ii)	Up to 15	2
iii)	16 - 50	3
iv)	51 - 150	5
v)	151 and above	8

H-2.3 These bottles shall be chosen at random from the lot and to ensure randomness of selection, random number tables shall be used (*see* IS 4905). In case such tables are not available, following procedure may be adopted.

H-2.3.1 Starting from any bottle count them as 1, 2, 3, etc., up to r and so on, in one order. Every r^{th} bottle thus, counted shall be withdrawn to give a sample for test, where r is the integral part of N/n (N being the lot size, and n the number of bottles to be chosen from the lot).

H-3 TEST SAMPLES AND REFEREE SAMPLES

H-3.1 Before drawing the samples, the material in the bottles chosen (*see* H-2.2) shall be thoroughly mixed by shaking or stirring or rolling. Samples shall then be drawn with the help of a suitable clean and dry sampling instrument.

H-3.2 From each bottle, three test samples shall be drawn, the volume of each sample being sufficient to conduct all the tests specified in 5.1 to 5.11. All the test samples thus obtained shall be transferred to sample containers (*see* H-1.6), and marked with all the details of sampling (*see* H-1.8). These samples shall then be separated into three identical sets of test samples in such a way that each set has a test sample representing each bottle selected (*see* H-2.2). One of these three sets shall be for the purchaser, another for the supplier, and the third for the referee.

H-3.3 Referee Sample

Referee sample shall consist of the set of test samples (*see* H-3.2), marked for this purpose and shall bear the seals of both the purchaser and the supplier and shall be kept at a place agreed to between the two.

H-4 NUMBER OF TESTS

Tests for all the requirements of the specification, given in 5.1 to 5.11, shall be conducted on each of the samples in a set.

H-5 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to the requirements of the specification, if each of the test result satisfies all the relevant requirements of the specification individually.

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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